Train volumes (both locomotive and average rail cars per train) during the daytime (7 a.m. to 10 p.m.) and at night (10 p.m. to 7 a.m.) and train speeds were input into the H.U.D. noise assessment guidelines (HUD-PDR-735) to determine terminal area noise. Rail noise calculated for each alternative is then compared to federal noise guidelines for 24-hour operation (i.e., 65 Ldn). The number and location of sensitive receptors that are exposed to noise levels exceeding 65 Ldn were then determined.

Using this HUD procedure, noise impact areas are shown on Figure S-18 for each rail strategy. The most significant impact is associated with Rail Strategy 3 which would affect about 53 residential units in the adjoining area north of the terminal between Martin and Junction. A portion of the St. Hedwig playfield falls within this noise footprint. Exact mitigation of this impact will be defined through more detailed analyses, if the project goes forward. Mitigation usually takes the form of a sound-attenuation wall.

Rail Strategy 2 is expected to be associated with a lesser impact, i.e., 37 residential units as well as the St. Hedwig playfield. Again, mitigation of unwanted noise on residential buildings is appropriate and with government assistance is likely to occur.

Finally, Rail Strategy 1 would impact almost as many residential units (35) as RS 2 as well as the playfield. However, under this alternative no sound-attenuation wall is likely to be constructed as rail activity will be the domain of the private sector which, in its 150 years in the area, has not chosen to construct a sound wall even when train activity was as high or higher than it is forecast to grow to over the next 25 years.

Air Quality

Both an airshed (i.e., local) analysis and a regional analysis are conducted for this evaluation factor. The airshed analysis translates a pollutant "burden" produced at the terminal into concentrations near the site and at nearby stations that regularly monitor air quality. Rail, truck, crane/sideloader and regular vehicular activity is translated into an amount of pollution produced in a given day. Comparison can then made of Rail Strategies 1, 2 and 3 to each other and to air quality standards.[2]

The regional effect on air quality may develop from improving the capacity and efficiency of intermodal service in the Detroit area and thereby shifting some activity from roads to rail. So, within the greater Detroit area, consolidation of intermodal activity at the proposed location will reduce drayage between terminals as well as the idle time at terminals. It will also have some effect on more long-distance trips between locations in Detroit and intermodal facilities in cities like Chicago, Toledo and/or Cincinnati.

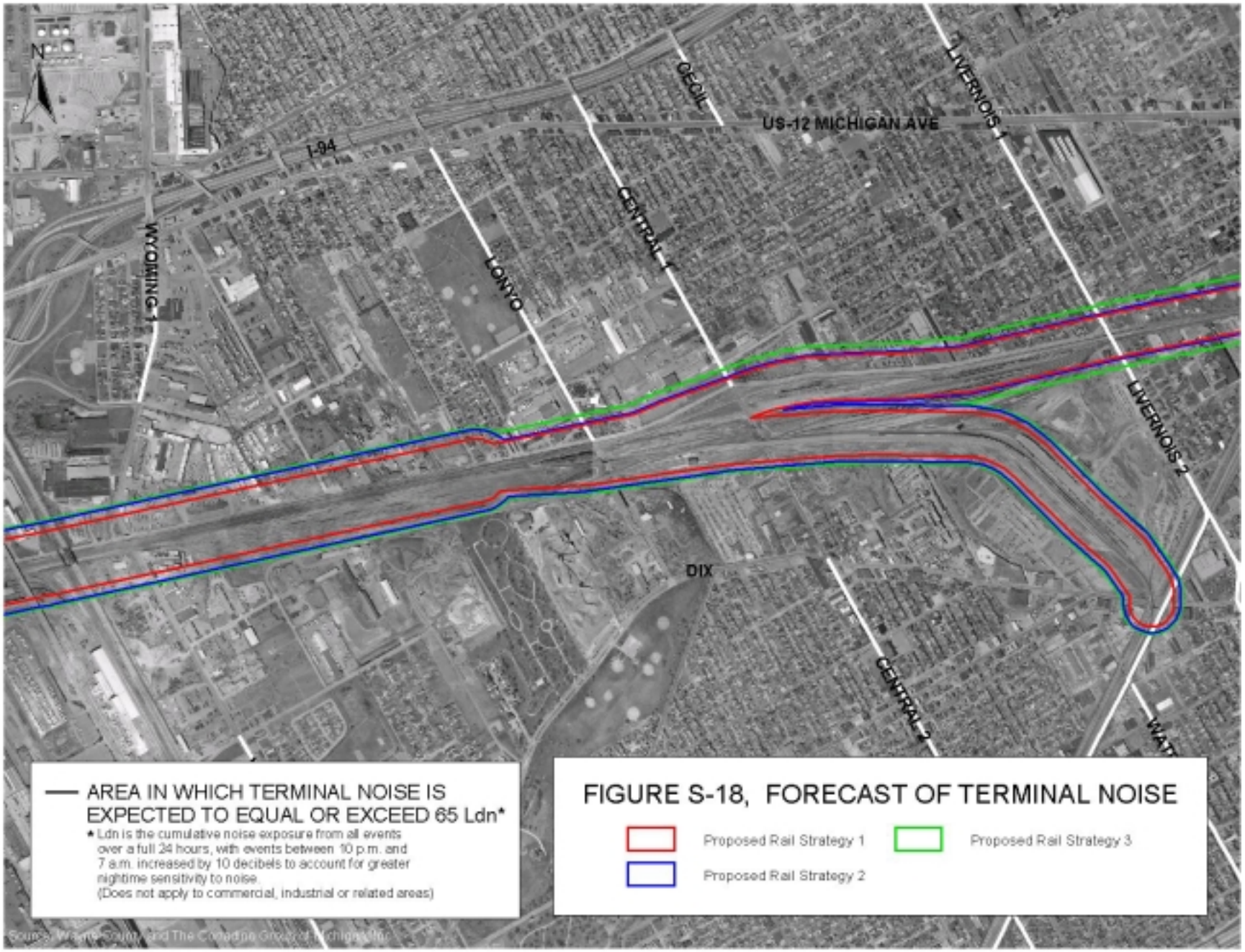
Airshed Analysis

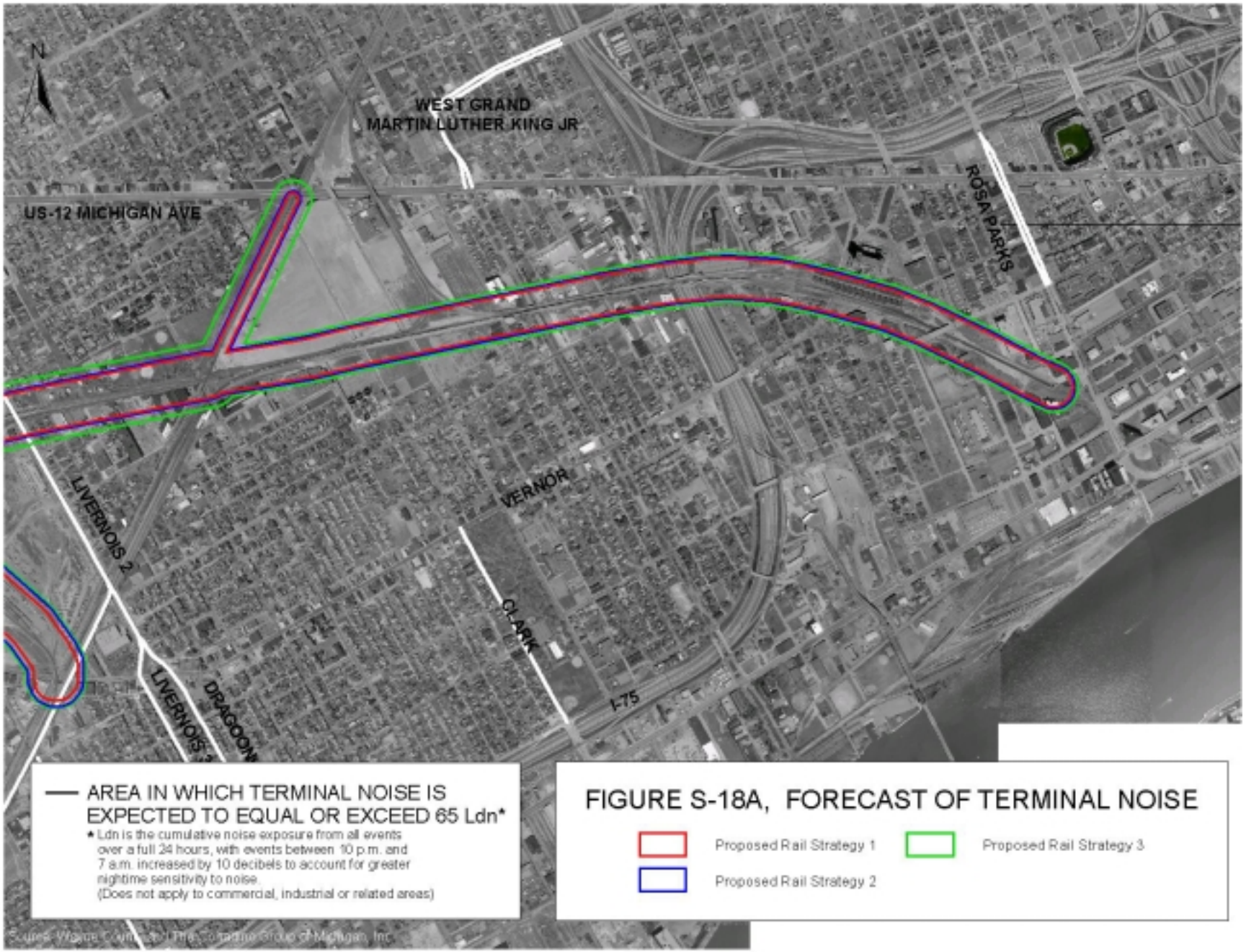
The U.S. Environmental Protection Agency applies the National Ambient Air Quality Standards for several key pollutants like carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3) and particulate matter (PM-10 and PM-2.5) (Table S-3). One or more of these pollutants is detected at air quality monitoring stations located around the Detroit-Livernois Yard. Three of those stations have been chosen because of their proximity to the rail terminal and the availability of recent and relevant data (Figure S-19).

For carbon monoxide, monitoring stations exist at Linnwood Avenue (Site 26-163-016) and Fort at Griswold (26-163-0083). Data for both eight-hour average and one-hour average concentrations indicates the trends in CO are downward over the last 20± years and standards are being met.

Data on NO_2 are also collected at the Linnwood Avenue monitoring station (23-163-0016). The trend indicates that the annual mean

[2]To provide a reasonable comparison, the same land area is modeled for all three scenarios. Under Rail Strategies 1 and 2, those areas that are not converted to rail terminal activity are assumed to remain "active" with the same land uses (and hence pollutant emitting characteristics) as they do today.


N
I-94
US-12 MICHIGAN AVE
CECIL
LIVERNOIS-1
WYOMING-1
LONYO
CENTRAL-1
LIVERNOIS-2
DIX
CENTRAL-2
— AREA IN WHICH TERMINAL NOISE IS EXPECTED TO EQUAL OR EXCEED 65 Ldn*
* Ldn is the cumulative noise exposure from all events over a full 24 hours, with events between 10 p.m. and 7 a.m. increased by 10 decibels to account for greater nighttime sensitivity to noise.
(Does not apply to commercial, industrial or related areas)
FIGURE S-18, FORECAST OF TERMINAL NOISE
Proposed Rail Strategy 1
Proposed Rail Strategy 2
Proposed Rail Strategy 3


N
WEST GRAND
MARTIN LUTHER KING JR
US-12 MICHIGAN AVE
ROSA PARKS
VERNOR
LIVERNOIS 2
CLARK
I-75
DRAGOON
— AREA IN WHICH TERMINAL NOISE IS EXPECTED TO EQUAL OR EXCEED 65 Ldn*
* Ldn is the cumulative noise exposure from all events over a full 24 hours, with events between 10 p.m. and 7 a.m. increased by 10 decibels to account for greater nighttime sensitivity to noise. (Does not apply to commercial, industrial or related areas)
FIGURE S-18A, FORECAST OF TERMINAL NOISE
Proposed Rail Strategy 1
Proposed Rail Strategy 2
Proposed Rail Strategy 3

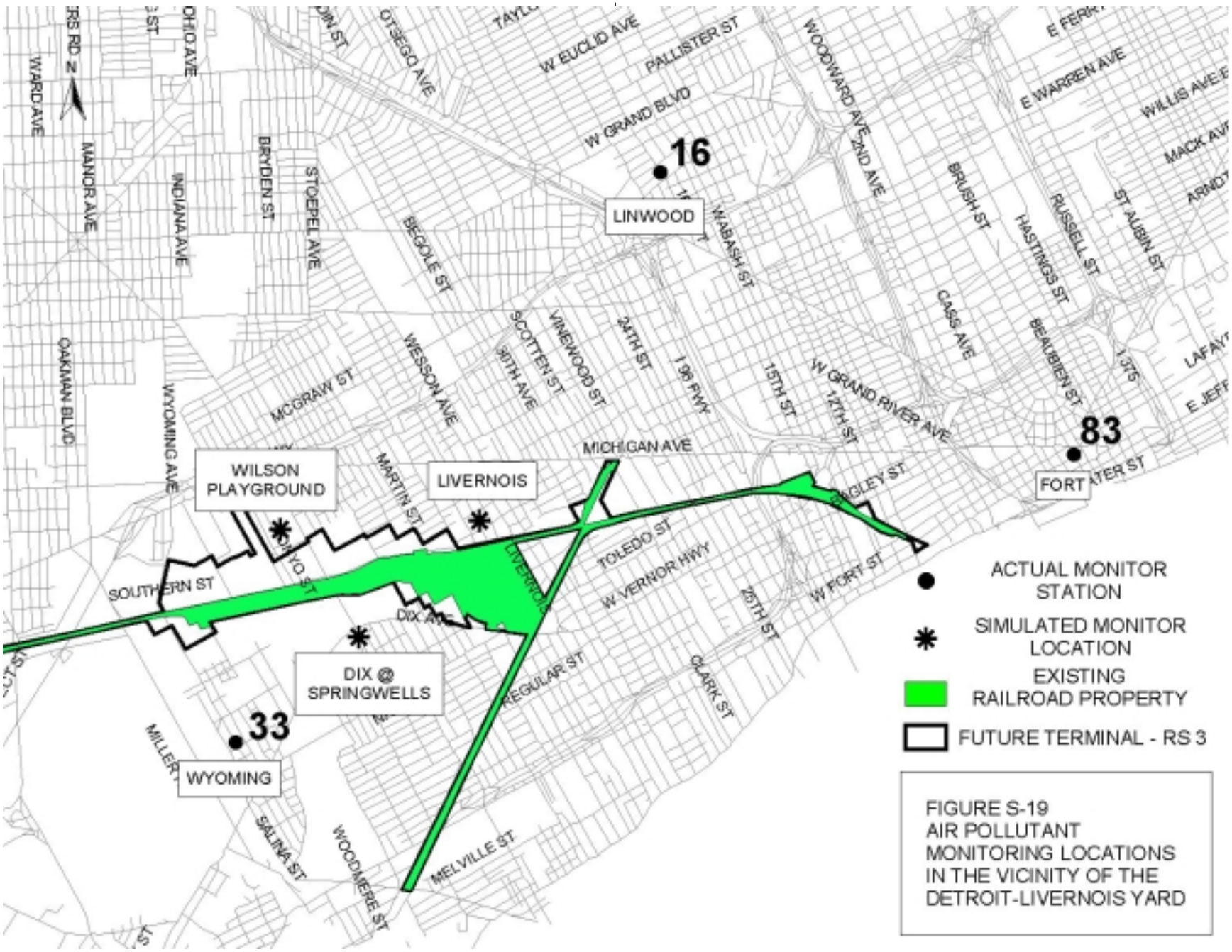


FIGURE S-19
AIR POLLUTANT MONITORING LOCATIONS IN THE VICINITY OF THE DETROIT-LIVERNOIS YARD

Table S-3
National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
Carbon Monoxide (CO)			
1-hour Average	35 ppm	(40 mg/m^3)**	Primary
8-hour Average	9 ppm	(10 mg/m^3)**	Primary
Nitrogen Dioxide (NO_2)			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)**	Primary & Secondary
Ozone (O_3)			
1-hour Average*	0.12 ppm	(235 µg/m^3)**	Primary & Secondary
Particulate < 10 micrometers (PM-10)			
Annual Arithmetic Mean	NA	50 µg/m^3	Primary & Secondary
24-hour Average		150 µg/m^3	Primary & Secondary
Particulate < 2.5 micrometers (PM-2.5)			
Annual Arithmetic Mean	NA	15 µg/m^3	Primary & Secondary
24-hour Average		65 µg/m^3	Primary & Secondary

Source: U.S. Environmental Protection Agency.
* The ozone 1-hour standard applies only to areas that were designated nonattainment when the ozone 8-hour standard was adopted in July 1997. This does not include the Detroit area. This provision allows a smooth, legal, and practical transition to the 8-hour standard.
** Parenthetical value is an approximately equivalent concentration.
NA - Not applicable.

for NO_2 is downward over the last 25 years and that the standard of .053 ppm is far from being exceeded.

Ozone is monitored at the Linnwood Avenue monitoring station (26-163-0016) as well. Twenty years of data reflect the downward trend in this pollutant. The current one-hour standard is not exceeded.

One monitoring station located in Dearborn provides ten years of data on particulate matter. The trend is downward and the standards are being met for PM-10. Only two years of data exist for PM 2.5 readings at this Dearborn location for the 24-hour Average condition. They show 50 micrograms per cubic meter (µg/m3) compared to the standard of 65. Readings for the Annual Arithmetic Mean are 20 µg/m^3 which exceeds the standard of 15 µg/m^3.

These data represent what is considered the "background" or "ambient" condition in and around the terminal area. It is this amount of pollution that is assumed to continue unabated into the future. The contribution to be made by the DIFT project, as modeled for the year 2025, is added. Pollution concentrations are then reported for the three monitoring sites plus Wilson Playground, a location at Dix and Springwells, and a third location at Livernois north of Kronk (Figure S-17).

To determine the pollution contribution of the various terminal strategies in 2025, the fuel consumption of each vehicle type (train locomotives, trucks, terminal equipment, and employees/visitors) using the terminal is first projected. Then their contribution to producing various pollutants is calculated consistent with EPA emission standards for each vehicle type.

EPA established exhaust emission standards in 1998 for oxides of nitrogen (NOx), hydrocarbons (HC), carbon monoxide (CO), particulate matter (PM), and smoke for newly manufactured and remanufactured locomotives. Regulation of the remanufacturing process is critical because locomotives are generally remanufactured five to ten times during their total service lives (typically 40 years or more), so standards that only applied to new locomotives would not achieve significant emissions reductions in the near term. The effects of these new standards will be cleaner air. For example, NO_2, which combines with hydrocarbons to form ozone, is expected to be reduced by 90 percent by 2010.

EPA also has initiated more protective tailpipe regulations which will significantly lower harmful diesel emissions from heavy-duty trucks (and buses) beginning in 2004. Improvements rely, in part, on reducing the level of sulfur in highway diesel fuel by 97 percent by mid-2006. Additional diesel standards and test procedures will begin in 2007. Heavy-duty gasoline engines will be required to meet new, more stringent standards starting no later than the 2005 model year. The new standards require gasoline trucks to be 78 percent cleaner and diesel trucks to be more than 40 percent cleaner than today's models.

The fuel that is forecast to be consumed and the pollutant burdens expected to be generated are shown on Tables S-4 and S-5, respectively. These data are input to the ICS3 (Industrial Source Complex) air quality model to produce pollutant concentrations to be compared to the EPA standards. To do this, model input must include five years of meteorological data used to define worst-case weather conditions for each of the pollutants generated by the DIFT activity, i.e., carbon monoxide, nitrogen dioxide, and particulates. Nitrogen dioxide data are then combined with data on hydrocarbons in a second model (3, RPM-IV Reactive Plume Model) to forecast ozone concentrations. Hydrocarbons and nitrogen dioxide are precursors to ozone formation.

The models' output is shown on Table S-6. It can be seen that for all currently monitored pollutants, the standards of today, carried forward to 2025, will not be exceeded except for the Annual Arithmetic Mean for PM 2.5. This condition is not caused by the DIFT which adds little to the ambient/background conditions. It is caused by the assumption that today's ambient air quality will remain unchanged in the future and that sources producing particulate matter now in existence will continue unabated into the future. This will not likely be the case at the Ford Rouge Plant, now under renovation. And, that is clearly not the case with a significant particulate generator—the diesel engine. EPA's recently-enacted standards will significantly lower diesel emissions from heavy-duty trucks and locomotives. This change has only been accounted for at the rail terminal NOT for the background traffic.

It is noted that NO_2 in the local area will double because of rail terminal activity. NO_2 is a precursor of ozone. However, because it takes a long time for ozone to form in the atmosphere, the locally-generated NO_2 will have an effect miles downwind and at a time later than when it is produced. As Table S-6 indicates, ozone in the local area does not exceed the 1-hour standard.

One final note is that while EPA is now applying a 1-hour standard for ozone, it has not been allowed to apply an 8-hour standard which it has formulated. Nevertheless, data (albeit limited to five years) indicate the 8-hour standard is now exceeded in the local area. So, if this ambient condition is carried forward into the future and the 8-hour ozone standard is applied, it will be exceeded in 2025 (Table S-7). But, the terminal area emissions do not cause this condition.

These results were reviewed with US EPA. It was determined by the consultant from those discussions that the forecast of DIFT contributions to the ambient air quality are reasonable. Again, the DIFT would not cause any standard to be exceeded.

Regional Analysis

In Rail Strategy 3, more than 5,000 trucks could be diverted from local (about 3,830 truck trips daily, at an average of five miles per trip) and regional travel (about 1,275 truck trips per day at an average of 60 miles per trip). These effects are expected to offset more than 50 percent of the pollutant burden generated by consolidating intermodal freight activities at the DIFT (Table S-8).

Rail Strategy 2 will be a less ambitious consolidation approach. Its regional effects on pollutant reductions are also less than RS 3 because fewer trucks would be diverted from local and regional trips (about 1,360 local trips per day at an average of five miles per trip and about 125 regional trips diverted daily at an average of 60 miles per trip). RS 2 would offset only about nine percent of the pollutant burden generated by rail consolidation (Table S-8).

Table S-4
Forecast of Daily Fuel Consumption (2025)
(Gallons Per Day)

Vehicle Type	Usage		
	RS 1	RS 2	RS 3
Locomotives	3,997	5,286	8,591
DIFT Trucks	3,204	4,282	6,929
Terminal Operations	1,656	2,214	3,583
Employees/Visitors	138	185	300
Subtotal	8,995	11,967	19,403
Surrounding Area	6,348	5,061	0
Total	15,343	17,028	19,403

Source: Arbor Vista Transportation and The Corradino Group of Michigan, Inc.

Table S-5
Annual DIFT Pollutant Burden Forecast (2025)
(Metric Tons)

Vehicle Type	Rail Strategy 1 (2025)				Rail Strategy 2 (2025)				Rail Strategy 3 (2025)			
	HC	CO	NOx	PM	HC	CO	NOx	PM	HC	CO	NOx	PM
Locomotives	11	40	191	7	14	53	252	9	23	86	410	14
DIFT Trucks	8	63	38	2	11	84	51	2	18	137	82	4
Terminal Operations	7	50	18	1	9	67	24	1	14	109	38	2
Employees/Visitors	4	51	1	NA	6	69	2	NA	9	112	3	NA
Total	30	204	248	10	40	273	329	12	64	444	533	20

Source: Arbor Vista Transportation and The Corradino Group of Michigan, Inc.

Table S-6
Detroit Intermodal Freight Terminal Project
Air Quality Analysis (Concentrations) (2025)
Local Area

Site ID	Address	Back-ground (ppm)	Back-ground as % of Standard	DIFT Rail Strategy 1 (ppm)	DIFT Rail Strategy 2 (ppm)	DIFT Rail Strategy 3 (ppm)	Rail 1 + Background	Rail 2 + Background	Rail 3 + Background	Rail 1 + Background as % of Standard	Rail 2 + Background as % of Standard	Rail 3 + Background as % of Standard
CO - 1 Hr. - Standard is 35 ppm												
16	6050 Linwood Avenue	8.2	22.4%	0.159	0.217	0.276	8.359	8.417	8.476	23.9%	24.0%	24.2%
83	Fort Street at Griswold	6.5	18.6%	0.393	0.479	0.532	6.893	6.979	7.032	19.7%	19.9%	20.1%
NA	Wilson Playground	7.4	21.1%	0.400	0.476	0.592	7.750	7.826	7.942	22.8%	22.5%	22.6%
NA	Dix at Springwells	7.4	21.1%	0.452	0.470	0.615	7.802	7.820	7.965	22.4%	22.5%	22.9%
NA	Livernois north of Kronk	7.4	21.1%	0.400	0.518	0.691	7.750	7.868	8.041	22.3%	22.6%	23.1%
CO - 8 Hr. - Standard is 9 ppm												
16	6050 Linwood Avenue	4.7	52.2%	0.081	0.100	0.151	4.781	4.800	4.851	53.1%	53.3%	53.9%
83	Fort Street at Griswold	4.1	45.6%	0.069	0.083	0.083	4.169	4.183	4.183	46.3%	46.5%	46.5%
NA	Wilson Playground	4.1	45.6%	0.150	0.202	0.250	4.250	4.302	4.350	47.2%	47.8%	48.3%
NA	Dix at Springwells	4.1	45.6%	0.198	0.293	0.229	4.298	4.393	4.329	47.8%	48.8%	48.1%
NA	Livernois north of Kronk	4.1	45.6%	0.125	0.178	0.292	4.225	4.278	4.392	46.9%	47.5%	48.8%
NO2 - Annual - Standard is 0.053 ppm												
16	6050 Linwood Avenue	0.0239	46.1%	0.0022	0.0028	0.0040	0.0261	0.0267	0.0279	49.2%	50.4%	52.6%
NA	Wilson Playground	0.0211	39.8%	0.0056	0.0064	0.0232	0.0267	0.0275	0.0443	50.4%	51.9%	83.6%
NA	Dix at Springwells	0.0211	39.8%	0.0100	0.0118	0.0237	0.0311	0.0329	0.0448	58.7%	62.1%	84.5%
NA	Livernois north of Kronk	0.0211	39.8%	0.0096	0.0118	0.0209	0.0307	0.0329	0.0420	57.9%	62.1%	79.3%
Ozone - 1-Hr. Standard is 0.12 ppm												
16	6050 Linwood Avenue	0.092	76.7%	0.0005	0.0006	0.0006	0.0925	0.0926	0.0926	77.1%	77.2%	77.2%
NA	Wilson Playground	0.098	81.7%	0.0025	0.0034	0.0083	0.1005	0.1014	0.1063	83.8%	84.5%	88.6%
NA	Dix at Springwells	0.098	81.7%	0.0027	0.0029	0.0071	0.1007	0.1009	0.1051	83.9%	84.1%	87.6%
NA	Livernois north of Kronk	0.098	81.7%	0.0026	0.0032	0.0042	0.1006	0.1012	0.1022	83.8%	84.3%	85.2%

Table S-6 (continued)
Detroit Intermodal Freight Terminal Project
Air Quality Analysis (Concentrations) (2025)
Local Area

Site ID	Address	Back-ground (ppm)	Back-ground as % of Standard	DIFT Rail Strategy 1 (ppm)	DIFT Rail Strategy 2 (ppm)	DIFT Rail Strategy 3 (ppm)	Rail 1 + Background	Rail 2 + Background	Rail 3 + Background	Rail 1 + Background as % of Standard	Rail 2 + Background as % of Standard	Rail 3 + Background as % of Standard
PM 2.5 - Annual. - Standard is 15 ug/m^3												
NA	Wilson Playground	20	133.3%	0.06	0.05	0.18	20.06	20.05	20.18	133.7%	133.7%	134.5%
NA	Dix at Springwells	20	133.3%	0.11	0.10	0.18	20.11	20.10	20.18	134.1%	134.0%	134.5%
NA	Livernois north of Kronk	20	133.3%	0.11	0.09	0.16	20.11	20.09	20.16	134.1%	134.0%	134.4%
PM 2.5 - 24-Hr. - Standard is 65 ug/m^3												
NA	Wilson Playground	50	76.9%	0.30	0.23	0.74	50.30	50.23	50.74	77.4%	77.3%	78.1%
NA	Dix at Springwells	50	76.9%	0.45	0.35	0.51	50.45	50.35	50.51	77.6%	77.5%	77.7%
NA	Livernois north of Kronk	50	76.9%	0.53	0.39	0.54	50.53	50.39	50.54	77.7%	77.5%	77.8%
PM 10 - Annual. - Standard is 50 ug/m^3												
33	2842 Wyoming Avenue	35	70.0%	0.08	0.03	0.06	34.98	34.93	34.96	70.2%	70.1%	70.1%
NA	Wilson Playground	26	52.0%	0.12	0.05	0.18	25.72	25.65	25.78	52.2%	52.1%	52.4%
NA	Dix at Springwells	26	52.0%	0.27	0.10	0.18	25.87	25.70	25.78	52.5%	52.2%	52.4%
NA	Livernois north of Kronk	26	52.0%	0.33	0.09	0.16	25.93	25.69	25.76	52.7%	52.2%	52.3%
PM 10 - 24-Hr. - Standard is 150 ug/m^3												
33	2842 Wyoming Avenue	115	76.7%	0.53	0.16	0.33	115.53	115.16	115.33	77.0%	76.8%	76.9%
NA	Wilson Playground	89	59.3%	0.81	0.23	0.74	89.64	89.07	89.57	59.9%	60.0%	59.8%
NA	Dix at Springwells	89	59.3%	1.33	0.35	0.51	90.16	89.18	89.34	60.2%	59.7%	58.7%
NA	Livernois north of Kronk	89	59.3%	1.77	0.39	0.54	90.60	89.22	89.37	60.5%	59.6%	59.6%

Source: Huffand Huff

Table S-7
Detroit Intermodal Freight Terminal Project
Local Air Quality Analysis for
Ozone at 8-Hour Standard (0.08 ppm) (2025)

Site ID	Address	Back-ground (ppm)	Back-ground as % of Standard	DIFT Rail Strategy 1 (ppm)	DIFT Rail Strategy 2 (ppm)	DIFT Rail Strategy 3 (ppm)	Rail 1 + Background	Rail 2 + Background	Rail 3 + Background	Rail 1 + Background as % of Standard	Rail 2 + Background as % of Standard	Rail 3 + Background as % of Standard
16	6050 Linwood Avenue	0.081	101.25%	0.0002	0.0004	0.0004	0.0812	0.0814	0.0814	101.5%	101.8%	101.8%
NA	Wilson Playground	0.085	106.25%	0.0019	0.0021	0.0007	0.0869	0.0871	0.0857	108.6%	108.9%	107.1%
NA	Dix at Springwells	0.085	106.25%	0.0026	0.0034	0.0098	0.0876	0.0884	0.0948	109.5%	110.5%	118.5%
NA	Livernois north of Kronk	0.085	106.25%	0.0038	0.0046	0.0064	0.0888	0.0896	0.0914	111.0%	112.0%	114.2%

Source: Huff and Huff

Table S-8
Annual Pollutant Burden Offset (metric tons)
Associated with Truck Trip Diversion
Regional Analysis

Rail Strategy 2

Pollutant Reduction / Pollutant Type	SEMCOG Region	Crosstown & Local	Idling	Total Savings	DIFT Burden	Increase w/DIFT	Percent Reduction
HC	2	5	1	8	65	57	12.3%
CO	15	28	6	49	443	394	11.1%
NOx	21	16	3	40	533	493	7.5%
PM	0	1	0	1	20	19	5.0%
Totals	38	50	10	98	1061	963	9.2%

Rail Strategy 3

Pollutant Reduction / Pollutant Type	SEMCOG Region	Crosstown & Local	Idling	Total Savings	DIFT Burden	Increase w/DIFT	Percent Reduction
HC	26	14	3	43	65	22	66.2%
CO	153	78	22	253	443	190	57.1%
NOx	219	46	13	278	533	255	52.2%
PM	1	1	1	3	20	17	15.0%
Totals	399	139	39	577	1061	484	54.4%

Source: Arbor Vista Transportation and The Corradino Group of Michigan, Inc.

Next Steps

The results of the examination of alternative rail strategies are summarized on Table S-9. These data and others summarized in this document are now to be reviewed by the Michigan Department of Transportation and the Federal Highway Administration, along with a number of local agencies.

Table S-9
Summary of Rail Strategy Impacts

Evaluation Factor \ Rail Strategy	RS 1	RS 2	RS 3
Engineering Difficulty	NA	Low	Low
Displacements	0 acres	45 acres	340 acres
	0 residences	0 residences	74 residences
	0 businesses	13 businesses	76 businesses
Cultural Resources	No effect	No effect	No effect
Community Cohesion	Negative	Neutral to Positive	Neutral to Positive
Environmental Justice	NA	No disproportionate effect	No disproportionate effect
Noise	35 residences	0[1]	0[2]
Air Quality	No EPA standard exceeded due to terminal ops.	No EPA standard exceeded due to terminal ops.	No EPA standard exceeded due to terminal ops.
		Regional offset 9%	Regional offset 54%

Source: The Corradino Group of Michigan, Inc.

[1]Noise wall likely will be built. Otherwise 37 residential units and St. Hedwig Playfield affected.

[2]Noise wall likely will be built. Otherwise 53 residential units and St. Hedwig Playfield affected.

The public will also review this work. Meetings will be held on October 24 and October 25 at the following locations beginning at 6:30 p.m.:

Wednesday October 24, 2001	Thursday October 25, 2001
Dearborn Ice Skating Center 14900 Ford Road	LASED Youth Center 7150 W. Vernor

Based on this interaction, the consultant will conduct additional analysis so it can prepare a recommendation to the Michigan Department of Transportation on whether the project is feasible and should proceed. That recommendation will be part of public meetings to be held in early December 2001.

For more discussion of the information provided in this report, and on any aspect of the Detroit Intermodal Freight Terminal Project, the public is invited to call (1.313.964.4543 or 1.800.880.8241), fax (1.313.964.1984), or e-mail at www.mdot.state.mi.us/projects/DIFT. If a meeting is desired, it can be scheduled by using the above addresses/phone numbers.